

Title: **MICROSCOPE CARE AND USE**

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1.0 OBJECTIVE

The purpose of this SOP is to provide guidance in the care and use of laboratory microscopes, including compound, epi-fluorescence, and dissecting microscopes.

2.0 HEALTH AND SAFETY

Personnel should wear lab coats and chemical resistant gloves when preparing and handling slides of dosed or chemically preserved samples. See appropriate SOPs for methods of specimen handling and slide preparation. **If the mercury bulb of the epi-fluorescence microscope should explode (only likely if the scope is not properly handled), leave the room, close the door and contact the laboratory supervisor and laboratory safety officer immediately.

3.0 PERSONNEL/TRAINING/RESPONSIBILITIES

Personnel should be trained in microscope care before unsupervised use is permitted.

4.0 REQUIRED AND RECOMMENDED MATERIALS

Microscope
Microscope cover
Immersion oil
Ethanol
Lens paper

*Other materials required will depend on the specific microscope activity.

5.0 PROCEDURE

5.1 Microscope Care and Use

5.1.1 All microscopes

- Always remove the cover before turning on the microscope.
- **Never** use oil on any objectives other than 100x oil objectives.
- Never view slides without a cover slip, except when using the dissecting microscopes (and never place a specimen directly on the stage).
- Never force a knob or lever on the microscopes. If it does not turn easily, **stop!**
- Use caution when focusing. It is possible to smash the objective into the slide and break it.
- Do not remove or exchange microscope objectives or eye pieces without supervisor permission.
- When finished using the microscope:
 - return the light to the lowest setting and turn off the light
 - clean the objectives with lens paper and ethanol only (**Never** use Kim-Wipes on the optics!)
 - if oil was used, be sure all oil is thoroughly removed after use.
 - turn the nose piece so that either an open position or the lowest power objective is facing the stage
 - move the stage to its lowest position
 - cover the microscope (Do not replace the cover until the lamp is cool!)

5.1.2 Epi-fluorescence microscope

- The epi-fluorescence microscope has a mercury lamp in an external lamp housing. It is imperative that this lamp be used properly.
- The computer should be turned **off** before turning the mercury lamp **on** to avoid a power surge and possible damage to the computer.
- Remove microscope cover and allow the mercury lamp to warm-up for approximately 15 minutes before use.

- Once the mercury lamp is turned on, it should stay on for a minimum of 30 minutes before turning the lamp off.
- **Never** leave the mercury lamp on for extended periods of time if the scope is not in use. The bulb has an estimated 200 hour life-span. The bulbs are expensive. In addition, if the bulb should explode the entire laboratory will be contaminated with mercury vapor. The bulb needs to be rotated after every 50 hours of use and changed after 200 hours of use. Please inform the microscope administrator when the bulb counter approaches 50, 100, 150 or 200.
- **Never** attempt to change or rotate the bulb without supervisor permission.
- Do not change any settings, or attempt to align the lamp without supervisor permission.

5.2 Using the Cameras

5.2.1. Still Photos

- 35 mm film (slide or print) may be used.
- The film is loaded on the camera body like any 35 mm camera. The film will wind automatically.
- There must be the correct photo eyepiece in the phototube for proper function.
- Set the iso film speed using the pullout stopper on the side of the camera to the same setting as the film.
- Exposure time will be set depending on the intensity of the light. Turn the light source to full power and slightly back off, the lower the exposure time the more likely the photo will turn out okay.
- There is an f-stop function on the camera, the pull out stopper that sets the film speed functions as the f-stop when not pulled out for speed setting. One click up or down essentially doubles or halves the shutter speed.

5.2.2. Video Camera Software.

- The video camera is exchangeable between the stereodissecting and the epi-fluorescent microscopes. See microscope administrator for assistance if you need to move the camera.

- The mercury lamp on the epi-florescent microscope must be turned off before the computer is turned on.
- Turn on the video camera power source, the computer and video monitor
- remember, the phototube must have the proper eyepiece in for functionality.
- On the computer, Sigma Scan Pro is the video analysis software. A tutorial is available for learning this software.
- Click on the camera icon on the main software screen, the live monitor should begin receiving microscope images at this time. Use the “acquire” command to capture the image on screen.
- For training/additional assistance, please see the microscope administrators: (stereodissecting microscope - Ed Wirth, epi-fluorescent microscope - Marie DeLorenzo).

6.0 QUALITY CONTROL/QUALITY ASSURANCE

Remember to re-calibrate each time you use Sigma Scan Pro for image measurements, as camera position/settings may have been altered since your last use.